CARBON ISOTOPE HISTORY OF CARIBBEAN SURFACE WATERS REVEALED BY CORALLINE SPONGES. *Memoirs of the Queensland Museum 44: 91. 1999*:- Live coralline sponges of the species *Ceratoporella nicholsoni* were collected from caves of north Jamaican reefs (20m depth) and from the deeper slope of Pedro Bank (125m depth). These sponges build a very dense aragonitic basal skeleton in apparent isotopic equilibrium with ambient water. Uranium-thorium dating of four specimens resulted in ages of 450-600 years. Within that timeframe, the sponge skeletons provide a continuous carbon isotope record, which starts at the end of the medieval warm period (1400AD) and covers the 'Little Ice Age' (about 1550-1850AD), as well as the industrial period (since ca. 1850AD). With a sample resolution of 0.7mm and growth rates of 0.2-0.4mm/year the temporal resolution is about 2-4 years. The carbon isotope records show an excellent linear correlation with the atmospheric pCO_2 history, as recently reconstructed from Antarctic ice cores (Etheridge et al., 1996). We find no significant difference between the preindustrial and the industrial regression slopes (-0.013 permil/ppm) which agrees with a common mechanism for the observed surface water carbon isotope variations, i.e. addition/removal of isotopically 'light' organic carbon to/from the atmosphere-surface ocean-biosphere system. The 'Little Ice Age' is characterized by a slight increase of $\delta^{13}C$ values (+0.1 permil), peaking around 1700AD During the same period, pCO_2 was about 6ppm lower than during the medieval warm period. Both can be explained by an increase in the terrestrial organic carbon reservoirs or in oceanic productivity. The Pedro Bank specimen, collected from the uppermost thermocline, shows only a dampened $\delta^{13}C$ increase during the Little Ice Age and a slightly subdued industrial $\delta^{13}C$ decline. This is expected because of the greater influence of deep-water at this depth. A comparison of the observed variation of marine $\delta^{13}C$ values and $\delta^{13}C$ of atmospheric CO_2 included in Antarctic ice allows one to constrain the maximum global average cooling of the ocean surface layer during the Little Ice Age to ca. -0.7K (possible range 0 to -2K). Further comparison to the simultaneous pCO_2 decrease of 6ppm suggests an even smaller cooling. Alternatively, an enhanced oceanic export productivity could partly explain the observations. ❐ *Porifera, carbon isotope history, coralline sponges.*

Literature cited.

ETHERIDGE, D.M., STEELE, L.P., LANGENFELDS, R.L., FRANCEY, R.J., BARNOLA, J.M. & MORGAN, V.I. 1996. Natural and anthropogenic changes in atmospheric CO_2 over the last 1000 years from air in Antarctic ice and firn. Journal of Geosphysical Research (D) 101: 4115-4128.

Florian Böhm, Wolf-Christian Dullo, Anton Eisenhauer, GEOMAR, Wischhofstr.1-3 D-24148 Kiel, Germany; Michael M. Joachimski, Institut für Geologie, Schloßgarten 5, D-91054 Erlangen Germany; Helmut Lelnert, Joachim Reitner (email: jreitne@gwdg.de), Institut und Museum für Geologie und Paläontologie, Universität Göttingen, Goldschmidt-Strasse 3, D-37077 Göttingen, Germany.

TIME-LAPSE STUDIES OF SPONGE MOTILITY AND ANATOMICAL REARRANGEMENTS. *Memoirs of the Queensland Museum 44: 91. 1999*:- Sponges have a general reputation as sessile and static animals, but this view has been contradicted by time-lapse microscope studies of live intact sponges belonging to several taxa (2 freshwater and 5 marine genera). These studies have demonstrated that adult sponges form leading margins made of crawling cells (pinacocytes and mesohyl cells), and these crawling margins appear capable of generating shape changes and locomotion of the entire sponge. These together with tracing studies have shown that sponges can move up to 160µm/hr (4mm per day). Observed sponges also display continuous cell movements and anatomical rearrangements in their marginal regions. These rearrangements produce slow continuous changes in the spicule skeleton and in the canal systems. Both whole-sponge motility and the internal rearrangements appear to be strongly affected by factors such as substratum adhesiveness, grooves, internal tensile forces, and water flow patterns. These ongoing changes may be an important source for plasticity in a sponge's life history. ❐ *Porifera, anatomy, cells, crawling, locomotion, motility, anatomical rearrangement, time-lapse.*

Calhoun Bond (email: bondc@gborocollege.edu), Department of Biology, Greensboro College, 815 West Market St., Greensboro, NC 27401 USA; 1 June 1998.